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Accounting Choices for Tangible Assets: A Study of Greek Firms

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Abstract

The purpose of this paper is to investigate the choices of Greek firms regarding the measurement of an item of a fixed tangible asset subsequent to its initial recognition, including impairment recognition, under IAS 16 and IAS 36 using a sample of Greek firms for the years 2005, 2007 and 2009**.** Results indicate that the cost model is more likely to be adopted by the more leveraged firms. In addition, it has been examined the compliance of the sample firms with disclosure requirements of IAS 16 and IAS 36. It appears that the disclosure compliance of the sample firms with the disclosure requirements of IAS 16 and 36 is influenced by firm's choice of valuation method for the measurement of an item of a fixed tangible asset subsequent to its initial recognition. It appears that the firms that adopt the revaluation method exhibit lower compliance rates**.**

JEL Classification: M41.
Keywords: IFRS implementation, Fixed tangible assets, Greece.

1. Introduction

This paper examines the factors that influence the accounting policy decisions of firms operating in Greece. The Greek business environment possesses certain characteristics that provide the researcher the opportunity to investigate the factors that influence accounting policy decisions within a context which is quite different from that prevailing in many developed countries. In Greece, as in many European countries (e.g. France, Italy), the ownership structure of the majority of the firms is characterized by a high level of concentration (Nobes and Parker, 2000), while the main providers of funds for Greek companies are the banks – at least in the period before the debt crisis. Furthermore, in Greece there is a close linkage between tax accounting and financial reporting. These factors are generally not associated with

high quality published financial statements (Nobes and Parker, 2000). Indeed, Leuz et al. (2003) show that Greek companies appear to engage in some of the most extreme earnings management practices in the world. Bhattacharya et al. (2003) provide similar evidence, since in their study Greek firms are the most engaged in earnings management among firms from 34 countries. From January 1st 2005 onwards the listed companies in all EU countries have had to prepare their financial statements in accordance with IFRS. That development changed structurally the accounting environment of most EU countries, including Greece.

In order to investigate the accounting policy decisions of Greek firms this paper examines the application of IAS 16 *Property, Plant and Equipment*, by a sample of firms that are listed in the Athens Stock Exchange. We choose IAS 16 for two reasons. Firstly IAS 16 provides considerable discretion to firms regarding the measurement of an item of a fixed tangible asset subsequent to its initial recognition. Firms have the option to choose between the *cost model*, and the *revaluation model*. This study aims to investigate the factors that motivate certain firms operating in Greece to choose the revaluation model, while others prefer the cost model. In addition, firms' choice of valuation method can have significant impact upon accounting figures, since in many cases fixed tangible assets constitute a significant proportion of firms' total assets. Therefore, the examination of the application of IAS 16 provides us the opportunity to acquire some insights concerning the factors the influence Greek firms accounting policy decisions.

Furthermore, this paper investigates the extent of Greek companies' compliance to disclosure requirements laid out in IAS 16 and IAS 36 *Impairment of Assets* as well as some of the factors that may explain compliance. Disclosure compliance provides an indication of the quality of the published financial statements. The structural characteristics of the Greek business environment as outlined above are generally not associated with high disclosure compliance and high quality published financial statements (Nobes and Parker, 2000). Florou and Galarniotis (2007) found that the corporate governance transparency of Greek firms is low while the compliance of Greek firms with corporate governance disclosure requirements provided by the Greek legislation is also low (51,8 %). They conclude that Greek firms are reluctant to disclose information regarding their governance practices. On the basis of this discussion we would expect that the compliance of Greek firms with the disclosure requirements prescribed by IAS 16 and IAS 36 would not be particularly high.

The findings of this study add to our knowledge regarding the factors that explain the accounting policy decisions and the disclosure compliance of Greek firms. Given the similarities of Greek business environment with the environment prevailing in other European countries the findings of this study can be useful to researchers that examine accounting policy decisions and disclosure compliance in other European countries. This study contributes to the knowledge base that accounting regulators can use to determine the extent to which Greek firms comply with the disclosure requirements of IFRS and will assist in future directions in developing mechanisms that will monitor the implementation of IFRS.

The rest of this paper proceeds as follows. Section 2 provides a brief outline of the provisions of IAS 16 and IAS 36. Section 3 discusses the literature on the factors that influence firms' accounting policy decisions with special reference given to the policies concerning the valuation of tangible assets after their initial recognition. The same section discusses the literature on the importance of companies' disclosures, the impact of IFRS upon firms' financial statements, the degree of firms' compliance to IFRSs' disclosure requirements, and the association between firms' characteristics

and their compliance to disclosure requirements. On the basis of the literature the hypotheses being tested in this study are developed. In section 4 the sample and the research design followed in this article are described. Section 5 reports the results of the empirical investigation undertaken for the purposes of this study. Section 6 summarizes and concludes the paper with suggestions for further research.

2. IAS 16 and IAS 36

IAS 16 provides for two acceptable alternative approaches to accounting fixed tangible assets. The first of these is the historical cost model (the basic method), which provides that "After recognition as an asset, an item of property, plant and equipment shall be carried at its cost less any accumulated depreciation and any accumulated impairment losses" (par. 30, IAS 16). The alternative approach is the revaluation model, according to which "After recognition as an asset, an item of property, plant and equipment whose fair value can be measured reliably shall be carried at a revalued amount, being its fair value at the date of the revaluation less any subsequent accumulated depreciation and any accumulated impairment losses" (par. 31, IAS 16). It should be pointed out that the firms do not have the obligation to apply either the cost or revaluation model to all assets they control. Instead, they can apply different model to different categories of assets. Under the revaluation model the frequency of revaluations depends upon the changes in fair values of the items being revalued and, consequently, when the fair value of a revalued asset differs materially from its carrying amount, a further revaluation is required. Upward revaluations of fixed assets increase the carrying values of fixed assets and revaluation reserves in shareholders equity, but can reduce future earnings, return on total assets and return on equity (Henderson and Goodwin, 1992; Cheng and Lin, 2009). In fact the adoption of IAS by Greek Firms had as a consequence a 5% increase in the equity of Greek Firms for the year 2005 – first year of implementation of IAS by Greek firms. That increase was mainly attributable to the revaluation surpluses that resulted by the implementation of IAS 16 (Grant Thornton, 2005). Upward revaluation increases future depreciation expenses and therefore reduces future earnings and related financial ratios. Furthermore, the higher assets values lead to lower profit in case of the disposal of the asset (Henderson and Goodwin, 1992). On the other hand, the historical cost accounting does not recognize any increase in asset values even when the current values of assets have increased. As a consequence, under the cost model assets values could be underestimated and net profits could be overestimated due to lower depreciation charges.

The fundamental objective of IAS 36 is to ensure that firms' assets are not carried at amounts higher than their recoverable amount. In case an asset's carrying amount is more than its recoverable amount (the amount to be recovered through use or sale of the asset), impairment loss is recognized. IAS 36 requires an entity to assess at the end of each reporting period whether there is any indication that an asset may be impaired. Tests of impairment are necessary when there is an indication that an asset might be impaired.

3. Literature Review and Hypotheses Development

3.1 Valuation Method Choice

A number of studies have investigated the association between firms' choice of valuation method of fixed tangible assets subsequent to their initial recognition and certain firms' characteristics such as, firms' size, their profitability, their leverage, their liquidity (Aboody, et al., 1999; Brown, et al., 1992; Easton, et al., 1993; Lin and Peasnell 2000a, 2000b; Whittred and Chan, 1992; Gaeremynck and Veugelers, 1999; Missioner-Piera, 2007; Demaria and Dufour, 2007; Cheng and Lin, 2009, Christensen and Nikolaev, 2009; Seng and Su, 2010).

It has been argued that an association may exist between a firm's accounting policy decisions and its size. These two elements are linked by (i) the concept of visibility for political purposes, and the (ii) political costs that ensue from that visibility. Firms with greater political visibility are thought to be the subject of greater political scrutiny and are, therefore, more likely targets for wealth transfers. A firm's size has been assumed to be a proxy of its visibility. The size of a firm is supposed to influence, to a considerable extent, the political cost of a firm, since the larger the firm the more likely is that it will "attract" the attention of politicians as a potential target for a wealth transfer (Watts and Zimmerman, 1978). By reporting lower profits larger firms aim to reduce their political visibility, and as a consequence the possibility of high wealth transfers. Within this context, it has been hypothesized that larger firms are more likely to adopt income-decreasing accounting methods.

According to Brown et al. (1992) firms with higher assets values are more likely to revalue their assets in order to reduce their political costs. Christensen and Nikolaev (2009) found that the UK and German firms with higher assets values and higher equity are more likely to adopt the revaluation model for the valuation of their assets after their initial recognition. Similarly, Lin and Peasnell (2000b) and Cheng and Ling (2009) for the UK firms and Seng and Su (2010) for New Zealand firms found that the firms with higher sales are more likely to adopt the revaluation model. On the other hand Demaria and Dufour (2007) have not found any association between French firms' size and their accounting policy decision with respect to the valuation of their tangible assets after their initial recognition. The following hypothesis has been formulated and tested:

Hypothesis 1. The larger firms are more likely to adopt the revaluation model.

The role that accounting figures play in a firm's negotiations with the providers of credit capital, and the inclusion of accounting numbers-based terms in the debt agreements, suggest that a particular accounting choice can have important economic consequences for a firm (Wolfson, 1993; Lin and Peasnell, 2000b). The financial leverage of a firm is used as a proxy for the firm's need for debt capital, and its likelihood to violate debt covenants (Guenther, 1994). Banks' credit decisions may be adversely influenced by lower reported profits (Deakin, 1979). As a consequence, the highly leveraged firms are more likely to choose an income increasing policy. Findings of empirical research suggest that more highly leveraged firms make reporting policy choices that aim to influence financial institutions' lending decisions (Scholes et al. 2005). Furthermore, the violation of the accounting-numbers based terms of loan agreements, places a firm in technical default, a situation that can have particularly adverse consequences for that firm (Gopalakrishan and Parkash, 1995). In

order to reduce the likelihood that these events will occur, companies are more likely to prefer particular accounting policies. Firms with debt covenants usually have constraints relating to their debt-assets ratios. In such a case, a highly leveraged firm will have a motive to adopt an accounting policy that eases the pressure on the debt-asset ratio (Alfredson et al. 2005). Findings of empirical research appear to support that argument (Scholes et al. 2005).

The debt/equity ratio has been used as a proxy for a firm's dependency on debt financing. It can hypothesized that in case the banks' lending decisions are mainly affected by the level of reported profits, the highly leveraged firms will prefer higher reported profits and, as consequence, are more likely to adopt the cost model. When an entity applies the cost model the level of depreciation charges per annum would be expected to be lower as the depreciable amount is lower. If a firm adopts the revaluation model the effect on its reported income would be the opposite. Besides, if the asset is measured at fair value, the amount of profit (or loss) realized on sale would be immaterial, since the carrying amount of the asset should be close to that of the market price (Alfredson et al. 2005). On the other hand, if the financial institutions' lending criteria assign grater importance on firms' debt - total assets ratio and/or debt-equity ratio, entities would have a stronger motive to adopt the revaluation model, since a possible consequence of the effect adoption of the revaluation model is an increase in entity's assets and equities (via the revaluation surplus).

Similarly, the debt/equity ratio can be used as a proxy for a firm's likelihood to violate debt covenants. If the debt covenants include profit-related conditions, the more leveraged entities are more likely to adopt the option that have the less negative impact upon reported income. Consequently, the firms that adopt the cost model are expected to have a higher debt/equity ratio. Conversely, when the debt covenants include constraints relating to entities' debt / equity ratio, the highly leveraged firms would be more inclined to adopt the accounting treatment that result in higher assets and equities figures. Hence, the firms that adopt the revaluation model are expected to have a higher debt/equity ratio. It appears therefore, that the incentives for entities to choose among the alternative measurement models are entity-specific, since the entities face different pressures associated with the different external circumstances they deal with.

With few exceptions (see, Demaria and Dufour, 2007; and Seng and Su 2010) previous research has indicated that the more leveraged firms are more likely to adopt the revaluation model for the valuation of their tangible assets subsequent to their initial recognition (Brown, et al., 1992; Christensen and Nikolaev, 2009; Aboody, et al, 1999; Gaeremynck and Veugelers, 1999; Cheng and Ling, 2009; Whittred and Chan, 1992; Lin and Peasnell, 2000a and 2000b; Missonier-Piera, 2007; Jaggi and Tsui, 2001). The following hypothesis has been formulated and tested:

Hypothesis 2: The more leveraged firms are more likely to adopt the revaluation method for the measurement of fixed tangible assets subsequent to their initial recognition.

The profitability of a firm may also influence its decision to adopt the revaluation model for the valuation its assets subsequent to their initial recognition for reasons such as the firm's political costs and the accounting-number-based terms of loan agreements. As explained above firms with high profitability are likely to face significant political costs and as a consequence are expected to adopt the revaluation

model, which has a decreasing effect upon firm's reported profits. According to Easton et al. (1993) only 3 % of Australian firms adopted the revaluation model in order to reduce their reported profits. Moreover, Whittred and Chan (1992) and Brown et al. (1992) point out that despite the fact that revaluation of assets is most likely to result in a decrease in firms' profitability, in the same time will have a positive impact upon the value of firm's assets and as a result the political visibility of the firm will increase. Gaeremynck and Vaugelers (1999) argue that the revaluation of firm's assets aims to send a signal to investors regarding the future operating cash flows and generally firm's future performance. They argue that when a firm revalues its assets, it increases the possibility to raise funds since the increase in the accounting values of its assets signifies an improvement with respect to the assets' expected future cash flows. They found that high performance firms are less likely to adopt the revaluation method. Jaggi and Tsui (2001) found a positive association between future profitability of a firm and its decision to adopt the revaluation model. The following hypothesis has been empirically tested:

Hypothesis 3. Firms with high profitability are more likely to adopt the revaluation model.

3.2 Disclosure compliance

The disclosure of accounting information reduces information asymmetry between informed and uninformed investors (Iatrides, 2008). When high information asymmetry prevails investors would require high return in order to undertake high information costs (Amihud & Mendelson, 1986; Merton, 1987). The reduction of information asymmetry would facilitate the communication between firms' managers and shareholders, providers of debt capital and other stakeholders (Iatrides, 2008). Lower information asymmetry would lead to lower costs of acquiring equity and debt capital (Diamond & Verrecchia, 1991). As a result the related agency and political costs will be lower (Healy & Palepu, 2001).

According to Cooke (1989) the size of a firm is a variable that can explain, to a considerable extent, the quality of firm's disclosures. Firms with great political visibility are thought to be the subject of greater political scrutiny and more likely targets for wealth transfers. In other words, firms with high political visibility might face high political costs. The size of a firm is supposed to be a proxy of its political visibility. Thus, larger firms are more likely to be subject of political attention and scrutiny, and as a consequence to face higher political costs (Watts and Zimmerman, 1986). By providing extensive disclosures, larger firms aim to reduce their political costs (Moses, 1987; Ndubizu & Tsetsekos, 1992; Ali & Kumar, 1994; Iatrides, 2008). In addition, larger firms are usually characterised by a widespread ownership of their share capital and an ensuing separation of management and ownership. Within this context, larger firms are expected to face higher agency costs. By disclosing more accounting information larger firms aim to reduce their agency cost (Zimmerman, 1983). Furthermore, the financial statements of larger firms are more likely to be thoroughly examined and analysed by financial analysts and shareholders. As a result, considerable pressure is exercised to larger firms to improve the quality of their disclosure (Hossain and Adams, 1995). Besides, larger firms are expected to possess the resources that are necessary for the preparation of an event such as the

introduction of IFRS (Jones and Higgins, 2006). Within this context we test the hypothesis:

Hypothesis 4: Larger firms are more likely to comply with the disclosure requirements provided by IAS 16 and IAS 36.

The compliance of a firm to the disclosure requirements prescribed by particular accounting standards is affected by the profitability of the firm (Palmer, 2008). When the introduction of a new or a revised accounting standard is expected to adversely affect firms' income, companies are more concerned about issues relating to the implementation of the new standard and the way they will communicate to their shareholders their continuing underlying profitability (Jones and Higgins, 2006). According to agency theory the managers of profitable firms will disclose financial information to the external users of accounts in order to advance their interests. They will disclose detailed information in order to continue in their positions and their compensation arrangements. On the basis of the political costs theory, it can be argued that the firms with large political visibility will have an incentive to disclose more information in order to justify the level of their profits (Inchausti, 1997). Within this context, it is expected that the more profitable firms will have higher compliance rates than the less profitable firms (Inchausti, 1997; Palmer, 2008). According to signalling theory the more profitable firms are more likely to provide the market with more and better accounting information (Verrecchia, 1983; Dye, 1985; Trueman, 1986; Jung Kwon, 1988; Miller, 2002). Thus their disclosure compliance it is expected to be high. It should be pointed, however, that a number of studies have not confirm the positive association between the quality of disclosure and the company's profitability (Lang and Lundholm, 1993; Raffournier 1995). We test the hypothesis that:

Hypothesis 5: The more profitable firms are more likely to comply with the disclosure requirements provided by IAS 16 and IAS 36.

According to Amran et al. (2009) the creditors of highly leveraged firms have strong incentives to prompt management to disclose more information. More leveraged firms tend to be more speculative and riskier while the debt-holders have greater power over the financial structure of such firms (Oliveira et al. 2011). On the other hand, it has been argued that creditors can obtain the information they need by sources other than annual reports (Leuz et al. 2004**).** Importantly, in Greece as in other European countries (e.g. France, Germany), bank credit plays a dominant role in the financing of business enterprises. Banks have developed a close relationship with many companies, while in certain cases they own part of the firm's share capital. Thus, banks in many instances may directly obtain any relevant financial information, without having to rely upon publicly disclosed data. Consequently, the importance of public accounting information may further diminish. Within this context, the demand for high quality disclosure is not expected to be high. Given the opposing arguments that have been developed concerning the impact that financial structure may have upon disclosure compliance we do not predict a particular sign regarding the association between the two variables and we test the hypothesis:

Hypothesis 6: The rate of disclosure compliance is associated with the firm's leverage

The level of compliance with disclosure requirements is associated with the type of external auditors appointed (Glaum and Street, 2003; Ali et al. 2004; Setyadi et al., 2011). In particular, it is argued that there is a positive association between the engagement of Big-4 international auditing firms and the level of a firm's disclosure compliance. The choice of external auditor is a mechanism that aims to minimize agency costs. The companies audited by the major auditing firms have significant agency costs and they attempt to reduce these costs by employing the major auditing firms (Setyadi et al., 2011). Tsalavoutas and Evans (2010) found that only companies with non Big-4 auditors faced significant impact on net profit and liquidity on transition to IFRS. Chalmers and Godfrey (2004) argue that, in order to maintain their reputation and to avoid reputational costs, the larger and well-known auditing firms are more likely to demand higher levels of disclosure. Furthermore, the major international auditing firms have greater knowledge about IAS (Lopes and Rodrigues, 2007). In fact, Tsalavoutas and Evans (2010) found that the Greek firms that had experienced a smooth transition to IFRS, were the firms that were audited by Big-4 international auditing firms.

Hypothesis 7*:* The disclosure compliance is predicted to be higher in companies audited by the Big-4 auditing firms**.**

4. Research design

The hypotheses have been tested by reference to the choices of a measurement model and the compliance to the disclosure requirements prescribed by IAS 16 and IAS 36 of a sample 54 non-financial firms listed in the Athens Stock Exchange for the year 2005, 2007 and 2009. The firms included in the sample of listed firms were chosen in order to be representative of the (other) main sectors of the Greek Economy. The relevant information was hand-collected. The financial statements of each sample firm for each year have been examined in order to gather the relevant information.

For each category of disclosure it was determined which elements should be disclosed. Subsequently, it was examined whether the sample firms made the appropriate disclosures in their annual report. An issue with scoring disclosures in financial statements is whether or not an undisclosed information item is applicable to a sample firm. Several measures have been proposed in literature for dealing with this problem. Cooke (1989) proposed annual reports to be thoroughly examined before they were scored in order to determine whether the undisclosed information items were indeed inapplicable to the companies. Furthermore, the applicability of some items was determined by logical reasoning (Owusu-Ansah, 2000). For instance, it is sensible to expect a firm to disclose its accounting policy for securities valuation, if it owns a portfolio of securities. Both measures were adopted in this study.

The disclosure compliance of a company is depicted as the value a compliance ratio computed for each company. The compliance ratio is the ratio of what a company disclosed in its annual report to what it is obliged to disclose for each category of disclosure. For each item of disclosure there are three possibilities: the information item is disclosed in the annual reports (OK); the information item is not disclosed item in the annual reports because it is not applicable in the particular company (non applicable NA); the information item is not disclosed item in the annual reports despite the fact it is applicable in the particular company and this company should disclose it (non-mentioned, NM). Thus, disclosure ratio under the dichotomous approach has been calculated as follows:

$$C_j = \frac{T = \Sigma_{i=1}^{n} di}{M = \Sigma_{i=1}^{m} di} \quad (1)$$

Where:

C_j = the total compliance score for each company and $0 \leq C_j \leq 1$

T = is the total number of items disclosed (di) by company *j*

M = the maximum number of applicable disclosure items for company *j* that could have been disclosed

To explain the choice of valuation methods and the disclosure compliance of the sample firms the following variables have been used in the present study (see Table 1):

Table 1. Independent variables

Variable	Description	Variable name
Measure of size		
Market Value of Equity	Natural logarithm of market capitalization of firm's common stock at the beginning of the reporting period	MV Equity
Measure of profitability		
ROE	income divided by equity*	ROE
Leverage		
Debt ratio	total debt to equity	LEV
Auditor type		
Auditor type	Auditor type is measured by the	AUDTYPE
	presence of Big-4 auditors	

*It should be noted that in the case where equity is negative the variable ROE is not defined

For the purposes of this study a firm's size is measured with reference to the market value of equity at the beginning of the reporting period, since this measure of size is not affected by the firm's choice of valuation method.

The values of the independent and control variables values were calculated by the authors.

Table 2 presents descriptive statistics for the explanatory variables for the pooled sample.

Table 2. Descriptive statistics for explanatory variables (pooled data)

	M V OF EQUITY	LEVERAGE	ROE
Average	664.128	1.731	0.077
Median	53.209	1.326	0.053
Standard deviation	1949.601	1.341	0.176
Minimum	0.143	0.011	-0.456
Maximum	12702.16	8.086	1.004
Skewness	4.178	9.068	11.435
Kurtosis	20.947	10.097	29.578

The values of Skewness and Kurtosis suggest that the variables do not follow the normal distribution.

5. Empirical findings

5.1 Descriptive statistics

Table 3 presents the valuation method choices used by the firms in the sample. It appears that the majority of the sample firms choose the cost model, 85 % in year 2005 and 88 % in years 2007 and 2009. This finding is in line with the findings of other studies that found that only a small proportion of firms adopted the valuation model. According to Demaria and Dufour (2007) only 3.7 % of French firms chose to value their assets at their fair value in year 2005, while the corresponding percentage for the Spanish firms for the same period was 5 % (Adelo et al., 2009). Similarly, Christensen and Nikolaev (2009) found that the percentages of the UK and German firms that adopted the revaluation mode for the valuation of their fixed tangible assets in year were 5 % and 1 % respectively. On the other hand, Aboody et al. (1999) found that 58.9 % of the UK firms adopted the valuation of their fixed tangible assets at their fair value, and the revaluation had as a consequence an increase in the assets book values.

Table 3. Valuation method

YEAR	2005		2007		2009	
	Number of firms	Percentage	Number of firms	Percentage	Number of firms	Percentage
Firms that adopted the revaluation model (even for one group of tangible assets)	8	14.81%	6	11.11%	6	11.11%
Firms that adopted the cost model for all groups of tangible assets	46	85.18%	48	88.88 %	48	88.88%
Total	**54**	**100%**	**54**	**100%**	**54**	**100%**

An analysis of the disclosures in the annual reports suggests that the assets that are more likely to be valued on a fair value basis are land and buildings. Furthermore, it

appears that the firms that adopted the fair value model for the valuation of their buildings adopted the same method for the valuation of their land. This can be attributable to the fact that it is relatively easier to determine the fair values of a piece of land and/or building, given that there is an active market for the assets of these categories (Christensen and Nikolaev, 2009).

According to Table 4, 9.26 % of the sample firms recognized impairment losses in year 2005. In year 2007 7.4 % of sample firms recognized impairment losses, while 5.55 % of firms recognized a reversal of previously recognized impairment losses. In 2009 22.22 % of sample firms recognized impairment losses, while 5.55 % of firms recognized a reversal of previously recognized impairment losses. This increase in the recognition of impairment losses can be attributed to the financial crisis that affected Greek economy since 2008. From the total number of 12 sample firms that recognized impairment losses in 2009, 9 firms charged the impairment losses in the income statement, 2 firms charged the loss in the equity, 2 firms recorded the losses in both income statement and equity, while one company did not disclose where the impairment loss was charged to. For the three firms that recognized a reversal of impairment losses in 2009, two firms recorded the corresponding amount in the income statement while one did not disclose where the reversal of impairment loss was recorded.

Table 4. Impairment losses and reversal of impairment losses

YEAR	2005		2007		2009	
	Number of firms	Percentage	Number of firms	Percentage	Number of firms	Percentage
Firms that recognized impairment losses	5	9.26%	4	7.40%	12	22.22 %
Firms that recognized reversal of impairment losses	0	0%	3	5.55%	3	5.55%

Finally, it should be pointed out that all firms in the sample use the straight-line method of depreciation while one firm uses the units of production method for machinery only.

Tables 5 and 6 presents the disclosure compliance of sample firms to the disclosure requirements presided by IAS 16 and IAS 36 respectively. It can be observed that the disclosure compliance concerning: the adopted valuation method, the depreciation methods, the assets useful life, the book value before depreciation and the accumulated depreciation at the begging and the end of a period, and the reconciliation between book values at the begging and the end of the period, has been improving throughout the period 2005-2009.

Although all sample firms disclose the valuation basis used for the valuation of their fixed tangible assets, a number of them did not disclose the valuation method used for each category of fixed tangible assets. Two firms in 2005, and one firm in 2007 and 2009 did not disclose the adopted depreciation method.

However, when the revaluation method has been used for the valuation of fixed tangible assets a number of issues has emerged with respect to the firms' compliance to the disclosure requirements provided by IAS 16.

Table 5. Disclosure Compliance with the disclosure requirements of IAS 16

Year	2005			2007			2009		
	Number of firms		Percentage	Number of firms		Percentage	Number of firms		Percentage
	OK	**N/M**	**OK**	**OK**	**N/M**	**OK**	**OK**	**N/M**	**OK**
An entity shall disclose, for each class of property, plant and equipment:									
1. the measurement bases used for determining the gross carrying amount;	49	5	90.74%	49	5	90.74%	52	2	96.29%
2. the depreciation methods used;	52	2	96.29%	53	1	98.15%	53	1	98.15%
3. the useful lives or the depreciation rates used;	53	1	98.15%	54	0	100%	54	0	100%
4. the gross carrying amount and the accumulated depreciation (aggregated with accumulated impairment losses) at the beginning and end of the period	53	1	98.15%	54	0	100%	54	0	100%
5. a reconciliation of the carrying amount at the beginning and end of the period	53	1	98.15%	54	0	100%	54	0	100%
6. the existence and amounts of restrictions on title, and property, plant and equipment pledged as security for liabilities	50	4	92.59%	52	2	96.29%	50	4	92.59%
7.The amounts that have been included in the cost of an item of a property, plant and equipment during its construction period	7	2	77.77%	10	0	100%	10	0	100%
8. the amount of contractual commitments for the acquisition of	12	0	100%	15	0	100%	17	0	100%
9. the amount of compensation from third parties for items of property, plant and equipment that were impaired, lost or given up that is recognized in profit or loss.	0	0	0%	2	1	66.66%	0	0	0%
10) for the property, plant and equipment valued at fair value :									
a)the effective date of the revaluation	24	4	85.71%	23	5	82.14%	20	5	80%
b) the employment an independent professionally qualified valuer	19	9	67.85%	20	8	71.43%	21	4	84%
c)the methods and the assumptions used for the determination of fair value	6	22	21.43%	9	19	32.14%	11	14	44%
d)the use of values by a reference to an active market or recent transactions or other valuation methods	10	18	35.71%	12	16	42.86%	13	12	52%
e) the book value of a group of assets which is valued at fair value, in case that it had been valued at cost	0	28	0%	0	28	0%	1	24	4%
f) the revaluation reserves, their changes during the reporting period and the limitations concerning their distribution.	17	11	60.71%	12	16	42.85%	17	8	68%

Table 6. Disclosure Compliance with the disclosure requirements of IAS 36

Disclosure requirements according to IAS 36									
1. the amount of impairment losses recognized in profit or loss during the period and the line item(s) of the income statement in which those impairment losses are included.	5	0	100%	4	0	100%	9	1	90%
2. the amount of reversals of impairment losses recognised in profit or loss during the period and the line item(s) of the income statement in which those impairment losses are reversed.	0	0	0%	3	0	100%	2	1	66.66%
3. the amount of impairment losses on revalued assets recognised directly in equity during the period.	0	0	0%	0	0	0%	4	1	80%
4. the amount of reversals of impairment losses on revalued assets recognised directly in equity during the period.	0	0	0%	0	0	0%	0	1	0%
5) in case that cash generating units have been formulated :									
a) the method used for the calculation of the goodwill allocated to the various cash generating units	0	0	0%	0	1	0%	0	3	0%
b) method used for the estimation value in use	0	0	0%	1	0	100%	3	0	100%
c) method used for the estimation fair value	0	0	0%	1	0	100%	3	0	100%
d) the impact on the amount of the value in use of the various assumptions made in order to estimate this amount	0	0	0%	0	1	0%	0	3	0%

In particular, 4 companies in year 2005 and 5 companies in 2007 and 2009 did not disclose the effective date of the revaluation. Nine firms in 2005, 8 firms in 2007 and 4 firms in 2009 did not mention whether an independent evaluator conducted the estimation of fair values. The percentage of firms that disclose the assumptions and the methods that had been adopted in order to determine fair values was 21.43 % in 2005, 32.14 % in 2007 and 44 % in 2009. Only one firm - and only for one year (2009) - disclosed what would have been the book vale of the particular group of assets if the cost model has been adopted.

Table 7 presents the descriptive statistics with respect to disclosure compliance of the sample firms. The average value of the compliance rate is 83 % for 2005, 84% for 2007 and 88% for 2009. The minimum value of the compliance rate is around 42% for all years while the maximum value is around 100 % for all years.

Table 7. Descriptive statistics for compliance rate

Year	2005	2007	2009	Total sample
Average	0.830	0.840	0.878	0.850
Median	0.866	0.923	0.928	0.863
Standard deviation	0.178	0.177	0.152	0.152
Minimum	0.416	0.416	0.416	0.5
Maximum	1.0	1.0	1.0	1.0

5.2 Univariate analysis

5.2.1 Valuation method

Median test was used in order to investigate the association between certain firms' characteristics and sample firms' choices of valuation method. The tests were run for the pooled sample and on an individual year basis (see Table 8).

Table 8. Median Test for the choice of valuation method

Variables	Pooled Sample	2005	2007	2009
M. V. OF EQUITY	Pearson chi2 = 0,228 (0,63)	Pearson chi2 = 0,587 (0,44)	Pearson chi2 = 0,000 (1,00)	Pearson chi2 = 3,000 (0,083)
LEVERAGE	Pearson chi2 = 5,704 (0,017)*	Pearson chi2 = 5,282 (0,022)*	Pearson chi2 = 0,750 (0,386)	Pearson chi2 = 3,000 (0,083)
ROE	Pearson chi2 = 0,228 (0,633)	Pearson chi2 = 0,587 (0,444)	Pearson chi2 = 0,000 (1,00)	Pearson chi2 = 0,750 (0,386)

* significant at the 0,05 level

Leverage appears to be significantly associated with firms' choice of valuation method. It appears that for the pooled sample and the year 2005 sample there is a significant negative association between the dependent variable and the firms'

leverage. The more leveraged are less likely to adopt the revaluation model. Other factors do not appear to influence firms' choice of valuation method.

5.2.2 Disclosure compliance

The results of the tests conducted in order to investigate the association between the independent variables and the sample firms' compliance rate are presented in Table 9.

Table 9. Spearman Rank Correlations

	2005	2007	2009
MV of equity	0.306	0.258	0.238
	(0.03)*	(0.06)	(0.08)
Leverage	0.024	0.068	0.025
	(0.85)	(0.62)	(0.85)
ROE	0.007	0.395	0.323
	(0,95)	(0,00)**	(0,018)*

* significant at the 0,05 level
** significant at the 0,01 level

In 2005 there is a statistically significant positive association between compliance rate and the market value of equity at the beginning of the reporting period. It appears that the larger firms achieve higher compliance rate. A plausible explanation is that the larger firms were better prepared for the transition to IFRS in year 2005 which was the first year of the compulsory implementation of IFRS (see, Jones and Higgins, 2006). However, in 2007 the association between these two variables is not statistically significant. The compliance rate has a statistically significant positive association with profitability in 2007. It seems that for 2007 the more profitable firms are more likely to comply with disclosure requirements prescribed by IAS 16 and IAS 36. In 2009 the compliance rate has a statistically significant positive association with ROE. Firms' disclosure compliance does not appear to be associated with their leverage.

5.3 Multivariate analysis

In order to identify the factors that influence firms' choice of valuation method the following model was estimated:

Model 1: Valuation method= $\alpha_0 + \alpha_1$ MV Equity $+\alpha_2$ LEV+ α_3ROE + α_4AUDTYPE

The variable valuation method takes the value 0 when a firm adopts the costs model and the value 1 when a firm adopts the revaluation model. The other variables are defined as above. The statistical method used in order to identify the factors influencing the choice of valuation method was the logistic regression. It should be noted initially data for all years were pooled and logistic regression was estimated which included dummy variables for the years. In order to control for firms' sector classification dummy variables were included for the following sectors: industry, services and retailing.

In order to identify the factors that influence firms' disclosure compliance the following model was estimated using OLS:

Model 2: Compliance rate= $\alpha_0 + \alpha_1$ MV Equity $+\alpha_2$ LEV+ α_3ROE + α_4AUDTYPE + α_4 VALUATION

Where the variable *VALUATION* refers to the choice of valuation method and takes the value 0 when a firm adopts the costs model and the value 1 when a firm adopts the revaluation model. The other variables are defined as above.

5.3.1 Valuation Method

Table 10. Model 1

Variable	Pooled	2005	2007	2009
Constant	-1.49	-0.47	-3.05	-3.01
MV of Equity	0.06 (0.115)	0.028 (0.117)	0.18 (0.169)	0.14 (0.144)
LEV	-5.51 (0.21)*	-1.22 (0.432)**	-0.64 (0.243)**	-0.35 (0.227)
ROE	-0.31 (0.959)	-0.51 (1.478)	-1.57 (2.227)	-0.03 (0.868)
AUDTYPE	-0.911 (0.576)	-0.69 (0.569)	-1.09 (0.683)	-1.17 (0.740)
Sector 1	0.52 (0.782)	1.36 (0.922)	0.12 (0.852)	0.34 (0.822)
Sector 2	-0.00 (0.714)	0.33 (0.871)	-0.20 (0.763)	0.00 (0.727)
D_2005	0.03 (0.171)			
D_2007	-0.089 (0.070)			
Significance level	0.028	0.034	0.078	0.40
Pseudo R2	17.28%	25,83%	20,48%	16,04%

** significant at the 0,05 level*
*** significant at the 0,01 level*

The model (pooled data) is statistically significant and consistent with the findings of the univariate analysis. There is a significant association between firms' choice of valuation method, and their leverage. It appears that the association between the dependent variable and leverage is significant in 2005 and 2007 but not in 2009. The model that refers to year 2005 is statistically significant at the level of 5 %, while the model for year 2007 is statistically significant at a level of 10 %.

Both the univariate and the multivariate indicate that the more leveraged firms are less likely to adopt the fair value model for the valuation of their fixed tangible assets subsequent to their initial recognition. This result is not in line with the findings of previous research (Brown, et al., 1992; Christensen and Nikolaev, 2009; Aboody, et al, 1999; Gaeremynck and Veugelers, 1999; Cheng and Ling, 2009; Whittred and Chan, 1992; Lin and Peasnell, 2000a and 2000b; Missonier-Piera, 2007; Jaggi and Tsui, 2001). Possibly firms' executives believe that banks' lending decisions are based more on profitability indicators rather than debt/assets or debt/equity ratios. Thus, the highly

leveraged firms avoid the revaluation model which can have a negative impact upon firm's profitability. Cotter (1999) argue that when a firm chooses the revaluation model in order to avoid breaching the accounting-numbers-based terms of the loan agreements, doubts are raised concerning managements' credibility, a fact that might have an adverse impact upon the contractual costs of future loan agreements. Moreover, firm's providers of debt capital can discern the impact of the choice of revaluation method on the accounting figures and take it into consideration when they calculate the leverage ratio of the firm (Henderson and Goodwin, 1992; Lin and Peasnell, 2000a). No evidence has been found to support our hypotheses that firms' choice of valuation is associated with their size, profitability or the type of auditor they employ. Similarly sector classification does not appear to influence firms' choice of valuation method.

7.3.2 Multivariate Analysis for the Compliance rate.

It appears that the disclosure compliance of the firms' that adopt the revaluation model not particularly high (see Table 11). As mentioned in earlier paragraph, a considerable proportion of the firms that adopted the revaluation did not provide all the required information. The observed relationship rate raises some questions regarding audit quality and the enforcement of regulations in Greece especially since the financial statements of the companies in our sample were not qualified for inadequate disclosure. The multivariate analysis suggests that firms' disclosure compliance is not influenced by other factors.

Table 11. Model 2

Variable	Pooled	2005	2007	2009
Constant	0.72	0.56	0.87	-0.50
VALUATION	-0.14 (0.068) *	0.05 (0.136)	-0.26 (0.078)**	-0.25 (0.070)**
MV of Equity	0.02 (0.013)	0.019 (0.024)	0.01 (0.025)	0.034 (0.018)
LEV	-0.03 (0.017)	-0.03 (0.035)	-0.04 (0.040)	-0.01 (0.021)
ROE	0.42 (0.197)	0.18 (0.330)	0.937 (0.520)	0.38 (0.235)
AUDTYPE	-0.025 (0.049)	0.01 (0.086)	-0.07 (0.088)	-0.06 (0.139)
Sector 1	-0.10 (0.080)	-0.05 (0.142)	-0.27 (0.142)	-0.06 (0.822)
Sector 2	-0.06 (0.066)	0.061 (0.102)	-0.22 (0.100)	-0.07 (0.105)
D_2005	-0.11 (0.057)*			
D_2007	-0.11 (0.057)*			
Significance level	0.002	0.64	0.003	0.01
Pseudo R2	18.21%	8,65%	38,27%	35,72%

* significant at the 0,05 level
** significant at the 0,01 level

8. Conclusions

The present study examined the application of IAS 16 and IAS 36 by a sample of Greek firms for the years 2005, 2007 and 2009. In particular, it has been investigated what are the factors that might influence firms' choice between the two alternative valuation models provided by IAS 16 for the valuation of fixed tangible assets subsequent to their initial recognition (i.e., cost model and the revaluation model). The results indicate that the more leveraged firms are less likely to adopt the revaluation model. These findings do not support our hypothesis that the highly leveraged firms are more likely to adopt the revaluation model in order to increase the value of their assets and their equity and to avoid violating debt-covenants. Possibly the negative impact that the revaluation model can have on firm's reported income discourages highly leveraged firms from adopting it. Factors such as the size of the firm, its profitability and the type of auditor do not appear to influence firms' choice of valuation method.

In addition, within this paper has been investigated the disclosure compliance of the sample firms to the disclosure requirements provided by IAS 16 and IAS 36. It appears that the compliance rate of the sample varies considerably. The univariate analysis indicates that the disclosure compliance is positively associated with the size and the profitability of the sample firms. However, the multivariate analysis indicated that the disclosure compliance is associated with firms' choice of valuation since the firms that adopt the revaluation method exhibits lower compliance rates. A further investigation of the issues raised within this paper would benefit from inclusion of more firms in the sample and by adding more potentially explicative determinants.

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